Early Journal Content on JSTOR, Free to Anyone in the World

This article is one of nearly 500,000 scholarly works digitized and made freely available to everyone in the world by JSTOR.

Known as the Early Journal Content, this set of works include research articles, news, letters, and other writings published in more than 200 of the oldest leading academic journals. The works date from the mid-seventeenth to the early twentieth centuries.

We encourage people to read and share the Early Journal Content openly and to tell others that this resource exists. People may post this content online or redistribute in any way for non-commercial purposes.

Read more about Early Journal Content at http://about.jstor.org/participate-jstor/individuals/early-journal-content.

JSTOR is a digital library of academic journals, books, and primary source objects. JSTOR helps people discover, use, and build upon a wide range of content through a powerful research and teaching platform, and preserves this content for future generations. JSTOR is part of ITHAKA, a not-for-profit organization that also includes Ithaka S+R and Portico. For more information about JSTOR, please contact support@jstor.org.

PHYSIOGRAPHIC NOTES.

BY

RALPH S. TARR.

GEOLOGY AND PHYSICAL GEOGRAPHY OF JAMAICA.—For a number of years Prof. Robert T. Hill has been investigating the interesting phases of the geology and geographical development of Central America and the West Indies. His latest contribution—a well-illustrated report upon the Island of Jamaica (*Bulletin*, *Museum Comparative Zoology*, XXXIV., 1899, pages 1–256)—gives a concrete statement of the geographical development of this island and its relation to the other islands of the West Indies and the neighboring mainland.

Jamaica lies in "almost the exact center of the great Mediterranean," being about 65 miles south of eastern Cuba and almost due west of Haiti. Between Cuba and Jamaica the ocean descends to a depth of fully 18,000 feet, and the island itself rises, in its highest peaks—those of the Blue Mountains—to an altitude of 7,360 feet. On the island there are four great groups of rocks: (1) the oldest—a series of stratified and volcanic rocks, greatly displaced and deformed; (2) a series of marls and limestones of oceanic origin; (3) a variety of igneous rocks, penetrating the first and second, and, therefore, younger than either; and (4) more recent deposits of ocean marls and coral reef rocks.

The geologist will find many interesting details in this report, especially the discussion of the extensive deposits of limestone and the consideration of the various causes for the formation of these rocks,—a subject usually treated with great brevity.

The geographer will find here an interesting statement not only of the development of Jamaica, but of its relation to past changes in the West Indian-Central American region. According to Hill, the known history of Jamaica begins in the latter Cretaceous time, during which volcanic action was in progress. There then followed an extensive degradation, during which the high pre-existing land, covered with vegetation, was deeply worn and great beds of sediment were assorted and deposited in shallow waters. Subsidence accompanied this deposition, and this was closely followed by folding of the strata through the Miocene, during which the rocks were closely flexed and even completely overthrown. There then followed a deep subsidence, reaching certainly more than 7,000 feet, during which beds of deep-sea ooze were accumulated, and most, if not all of Jamaica was lowered beneath the sea. Then came an uplift, which not only restored the former land area, but extended it far beyond its present outline, connecting it with the adjacent island of Haiti on the east and possibly the Central American region to the southwest. This emergence was dominated by a low east and west folding, which caused the present elongate shape of Jamaica, and accompanying it was a great intrusion of igneous rock from below. The next stage in the history of the island was a renewal of the subsidence, which was succeeded by another upward movement, accompanied by slight deformation, and both accompanied and followed by great erosion. The next and last event was the general elevation, or, perhaps better, series of elevations, which have continued until the present time, restoring to the island the belt of land now forming the fringing coastal border and raising numerous coral reefs above the sea. The latter are now found, in the form of terraces of reef rock, at altitudes of 60, 25 and 15 feet.

The old idea, propounded by Humboldt, and followed in many books to the present day, that the formation of the Rocky Mountains and the Andes was not only contemporaneous, but continuous, is once more attacked by Hill. He points out again the fact that the Central American region shows no connecting ranges, but, on the contrary, east and west trends to the folds, the Central American region being rather a part of the West Indian than of the Andean and Rocky Mountain series. He also controverts the doctrine proposed by Spencer, and which many geologists have considered exceedingly doubtful, that the irregularities of the ocean bottom topography of the great American Mediterranean were due to submerged lands,—a kind of lost continent, an American Atlantis. The facts that Hill brings forward seem to prove conclusively that this topography is not due to erosion, but to orogenic causes.

While the general problem of the relation of Jamaican geological history to that of the entire West Indies is touched upon, it is presumed that Prof. Hill will later develop this relationship much more fully, as his detailed studies, which are still in progress, proceed to the other islands. It is a distinct contribution to the geology of a region hitherto little understood, and is accomplished with a breadth of view which is commendable.

PHYSIOGRAPHY OF CHATTANOOGA DISTRICT.—The region of the southern Appalachians has been made historic ground to the American physiographer by the work of various members of the United States Geological Survey, particularly Hayes and Campbell. The latest contribution to the literature of this region by Hayes (Physiography of the Chattanooga District, *19th Annual Report United States Geological Survey*, Part II., pages 1–58), after describing the relation of this interesting district to the neighboring country, discusses the rock structure of the district, and follows this by a detailed study of the physiography. In the Chattanooga district Hayes finds evidence of three quite distinct peneplains at different levels. It would be unfair to criticise his discussion of the subject adversely without more familiarity with the district than is possessed by the reviewer, though from the statement of the case in Hayes's paper there seems to be a complexity of physiography which could be more easily explained on the basis of the simpler hypothesis of bevelling. Not only are there level-topped hills, suggesting three peneplain surfaces, but this diversity is still further marked by monadnocks and unakas—a new term, introduced in this paper for the first time, and indicating "a large residual mass in relief above a less advanced peneplain."

After a discussion of the evidence of peneplains, Hayes considers the stream development, explaining in a way which cannot be properly abstracted here the peculiar courses of the Tennessee, Coosa, and tributary streams. One of his conclusions of wide-reaching importance can be stated in the following quotation:

> Effects (upon stream courses) due to difference in rock character and in structure are generally more striking and are first detected, but the broad modifications of drainage are most apt to be produced by the slight warping of the land surface which appears to accompany all uplifts.

It seems questionable whether the application of this principle has been fully recognized in studies of American physiography.

Whether or not one is convinced of the various peneplains which Hayes has attempted to prove, this paper must, from all standpoints, be considered one of the most important contributions to American physiography.